

# WISCONSIN EPI EXPRESS

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[Wisconsin Department of Health & Family Services](#)  
Division of Public Health  
Bureau of Communicable Diseases

"Surveillance provides information for action." [World Health Organization](#)

***The WISCONSIN EPI EXPRESS provides a regular update on communicable disease issues of importance in our state and is intended primarily for participants in the public health surveillance system. Please let us know if the topics covered are on target or if there are others that we should be addressing. Thank you. Herb Bostrom: [bostrhh@dhfs.state.wi.us](mailto:bostrhh@dhfs.state.wi.us)***

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## **1. NOROVIRUS: CHARACTERISTICS, RECENT WISCONSIN TRENDS, AND SPECIMEN COLLECTION**

Noroviruses are members of a group of viruses called caliciviruses, previously known as "Norwalk-like viruses", that cause acute gastroenteritis in humans. This group of viruses has also been referred to as caliciviruses (because of the virus family name) and small round structured viruses (because of their morphologic features). Noroviruses are named after the original strain "Norwalk virus", which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio in 1968.

### **Clinical Features**

Illness is characterized by acute onset of nausea, vomiting, abdominal cramps, and diarrhea. Symptoms such as headache, low-grade fever, chills, muscle aches and fatigue are also reported. Vomiting is relatively more prevalent among children, but a greater proportion of adults experience diarrhea. During the time of illness, people can feel ill and vomit, often violently and without warning, many times a day. This is sometimes referred to as "projectile vomiting". Patients can also experience vomiting alone, a condition first identified as "winter vomiting disease"<sup>1</sup>. Norovirus infections have an incubation period of 12 to 48 hours (median = 33 to 36 hours) and the duration of illness is usually one to two days. Although rare, severe dehydration caused by norovirus gastroenteritis can be fatal among susceptible persons (e.g., persons with weakened immune systems). No long-term aftereffects of norovirus infection have been reported.

### **Viral Transmission**

Noroviruses are found in the stool or vomit of infected people. Noroviruses can be transmitted through the fecal-oral route, by drinking fecally contaminated food or water, or by direct person-to-person spread, but airborne and fomite transmission may facilitate spread during outbreaks<sup>2-6</sup>. Although viral shedding before onset of illness may occur, shedding usually begins with the onset of illness and may continue for up to 10 days or longer after recovery<sup>7</sup>.

Noroviruses have unique characteristics that facilitate their spread during outbreaks (Table 1). They are highly contagious with a low infectious dose of <100 virus particles<sup>8</sup>. This readily

allows spread by droplets, fomites, person-to-person transmission, and environmental contamination, as evidenced by the increased rate of secondary and tertiary spread among contacts and family members. The ability of the virus to survive relatively high levels of chlorine (<10 ppm) <sup>9</sup> and varying temperatures (i.e., from freezing to 60 C) <sup>8</sup> facilitates spread through recreational and drinking water and food items. Because of the diversity of norovirus strains, lack of complete cross-protection, and lack of long-term immunity, repeated infections can occur throughout life.

<b>Table 1. Characteristics of “Noroviruses” that facilitate their spread during outbreaks.</b>		
Characteristic	Observation	Consequences
Low infectious dose	<10 <sup>2</sup> viral particles	Permits droplet or person-to-person spread, secondary spread, or spread by food workers
Prolonged asymptomatic shedding	10 days or longer	Increased risk for secondary spread or problems with control regarding food workers
Environmental stability	Survives ≤10 ppm chlorine, freezing, and heating to 60°C	Difficult to eliminate from contaminated water; virus maintained on ice and steamed foods
Substantial strain diversity	Multiple genetic and antigenic types	Requires composite diagnostics; repeat infections by multiple antigenic types; easy to underestimate prevalence
Lack of lasting immunity	Disease can occur with re-infection	Childhood infection does not protect from disease in adulthood; difficult to develop vaccine with lifelong protection

### **Foods, Food Workers and Foodborne Outbreaks**

Theoretically, any food item can potentially be contaminated with noroviruses through fecal contamination. Food items may become contaminated at their source. Certain foods such as shellfish (e.g., oysters or clams) are commonly implicated in norovirus outbreaks. Shellfish tend to concentrate the virus in their tissues. Noroviruses can contaminate the waters from which they are harvested <sup>10,11</sup>, and even harvests meeting bacteriologic standards of hygiene can contain noroviruses. In addition, cooking (e.g., steaming) might not completely inactivate noroviruses <sup>12</sup>.

Foods such as produce can also be contaminated in the field if exposed to human fecal material or contaminated water used for irrigation. Always wash raw vegetables thoroughly before eating.

Most foodborne outbreaks of norovirus infections arise through direct contamination of food by a food worker immediately before its consumption. Food workers with norovirus infections are a significant risk to others because they work with food or drink items many other people will consume. Because the infectious dose of noroviruses is low and the concentration of virus particles in stool is high, even minimal cross-contamination can result in substantial outbreaks. Ready-to-eat foods that require handling but no subsequent cooking (e.g., salads and deli sandwiches) pose greater risk. Liquid items such as salad dressing or cake icing allow for the even distribution of virus particles that can also lead to outbreaks.

Previously, the exclusion of ill food workers for 48-72 hours after resolution of illness was recommended to prevent outbreaks caused by food workers<sup>13</sup>. Prolonged duration of viral shedding that can occur among asymptomatic food workers increases the risk for secondary spread and is of concern in food worker-related transmission<sup>7</sup>. Food workers should always be reminded AND required to maintain strict personal hygiene. In small home-based catering businesses or family owned restaurants, sick children and infants in diapers should be excluded from food preparation areas and employees should wash their hands after contact with sick children or soiled diapers. In addition, any time food items are thought to have been contaminated with norovirus particles, they should be discarded and those in contact with such food items should wash their hands prior to handling other food items.

### **Person-to-Person Transmission**

Person-to-person spread of noroviruses occurs by direct fecal-oral and airborne transmission. Such transmission plays a role in propagating norovirus outbreaks, notably in institutional settings (e.g., nursing homes and day care centers), schools and on cruise ships. Although interruption of person-to-person transmission can be difficult, certain control measures may help, especially proper hand washing.

Frequent hand washing with soap and water is an effective means of prevention. The recommended procedure is to rub all surfaces of lathered hands together vigorously for  $\geq 10$  seconds and then thoroughly rinse the hands under a stream of water.

Because spattering or aerosols of infectious material might be involved in disease transmission, wearing masks should be considered for persons who clean areas substantially contaminated by feces or vomitus (e.g., hospital or nursing home personnel). Soiled linens and clothes should be handled as little as possible and with minimal agitation. They should be laundered with detergent at the maximum available cycle length and then machine dried.

Because environmental surfaces have been implicated in the transmission of enteric viruses, surfaces that have been soiled should be cleaned with an appropriate germicidal product (e.g., 10% solution of household bleach) according to the manufacturer's instructions. In situations in which the epidemic is extended by periodic renewal of the susceptible population (e.g., camps and cruise ships), the facility or institution may have to be closed until it can be cleaned appropriately.

### **Norovirus Infections in Wisconsin**

In 1997, the Wisconsin State Laboratory of Hygiene began reverse transcriptase polymerase chain reaction (RT-PCR) analysis for laboratory confirmation of norovirus infections. Prior to that time non-bacterial or non-parasitic outbreaks could only be classified as "Norwalk-like Viruses" based on onset of illness, clinical symptoms, and duration of illness. The agents of these outbreaks were listed as "Unknown". Since RT-PCR analysis became routine there has been a significant increase in the identification of norovirus outbreaks and the decline of outbreaks of

"unknown" origin (Table 1). From January through March 2004 there have been 14 laboratory-confirmed norovirus foodborne outbreaks compared to three bacterial outbreaks.

Table 1. Foodborne outbreaks in WI, 1997-2003								
Outbreaks	1997	1998	1999	2000	2001	2002	2003	Totals
Bacterial	13	9	9	12	10	15	16	84
<b>Norovirus</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>6</b>	<b>7</b>	<b>16</b>	<b>5</b>	<b>49</b>
Unknown	12	7	2	6	3	1	0	31
Totals	26	22	19	24	20	32	21	164

In 2003, the Bureau of Communicable Diseases, Communicable Disease Epidemiology Section began a database of person-to-person norovirus outbreaks. During that year there were 26 non-food or waterborne norovirus outbreaks identified in Wisconsin.

## **Recommendations Regarding Specimen Collection for Diagnosis of Norovirus**

### **Stool Specimens**

**Timing.** Specimen collection should be initiated as soon as possible. Delays in the collection of stool specimens could compromise establishing a viral diagnosis. Ideally, specimens should be obtained during the acute phase of illness (i.e., within 48--72 hours after onset) while the stools are still liquid or semisolid and the level of viral excretion is greatest. With the development of sensitive molecular assays, the ability to detect viruses in specimens collected later in the illness (up to 7 days) has been improved. If specimens are collected late in the illness, the utility of viral diagnosis and interpretation of the results should be discussed with laboratory personnel before tests are conducted.

In some outbreaks, secondary cases may be tested if there are no other laboratory-confirmed cases.

**Number and Quantity.** Ideally, up to 10 stool specimens from ill persons should be obtained within 72 hours of onset of illness. Stool specimens should be collected and placed in to a proper transport media (WSLH Kit # 10 - Cary Blair Transport). The smaller the specimen and the more formed the stool, the lower the diagnostic yield. Rectal swabs are of limited or no value because they contain insufficient quantity of nucleic acid for amplification.

**NOTE: All requests for norovirus testing must be approved by the Bureau of Communicable Diseases, Communicable Disease Epidemiology Section.** Only stool specimens from a "defined" outbreak will be tested. Sporadic cases are not tested because norovirus illness is not a reportable disease. Further, the test for noroviruses is very time-consuming and expensive, and most illnesses will have resolved by the time the results return. In addition, there is no specific treatment, so there is little information of clinical value to be obtained from a positive test for an individual patient. However, testing does provide valuable information regarding the spread of noroviruses during outbreaks.

*This overview was prepared by the Bureau of Communicable Diseases / Communicable Disease Epidemiology Section, February 2004*

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## 2. ARRIVAL OF HMONG REFUGEES ANTICIPATED

Beginning this July, Wisconsin will receive Hmong refugees from Wat Tam Krabok in Thailand. Wisconsin will receive between 2,500 - 3,700 Hmong in this resettlement effort. The Federal Government wants to complete resettlement to the US by December 31, 2004.

Most Hmong arriving in this wave of resettlement will have relatives in Wisconsin to assist them. They will be settling in approximately 13 counties of Wisconsin where there are already a significant number of Hmong.

A preliminary health assessment done by a team from the St. Paul Mayor's office, identifies the following health concerns:

- TB
- Diabetes

- Cancer
- Mental health - depression, PTSD, suicide ideation
- Lack of prenatal care - primarily from mistrust in clinic services at the camp
- Anemia for pregnant women
- Teen pregnancy rate high - sixty percent of the refugee population is under 18 years of age
- Higher than normal rate of birth defects - many women over 40 giving birth

Local Health Departments and area clinics will be providing initial health screening, follow-up and outreach health education in the first 90 days after the refugees arrive.

Communities are encourage to meet with area Hmong Mutual Assistance Agencies, Voluntary Resettlement Agencies, schools and area health care providers to plan and prepare for this incoming population.

For further information about refugee health in Wisconsin contact Savitri Tsering, TB Elimination and Refugee Health Coordinator in the Division of Public Health, 608/267-3733 or [tserisj@dhfs.state.wi.us](mailto:tserisj@dhfs.state.wi.us)

For more information about the Hmong resettlement from the Wat, contact Ying Lee at the Department of Workforce Development Immigration Integration Section - 608/267-7275 or [leeyi@dwd.state.wi.us](mailto:leeyi@dwd.state.wi.us)

### **3. WISCONSIN DIVISION OF PUBLIC HEALTH GUIDELINES: INVASIVE MENINGOCOCCAL DISEASE**

The Wisconsin Division of Public Health has released guidelines for reference during the response to a case of invasive meningococcal disease. These guidelines are intended to provide a succinct overview of the illness, a summary of national and state meningococcal disease data, and a review of the public health response to invasive meningococcal disease. Please feel free to share these with clinicians; however, this is not intended to be a reference for the general public.

Please contact Susann Ahrabi-Fard at 608-261-6955 or Donita Croft at 608-261-9303 to report a case of invasive meningococcal disease, or if you have questions about these guidelines or invasive meningococcal disease in general.



Invasive Meningococcal Disease Guidelines 2004.pdf

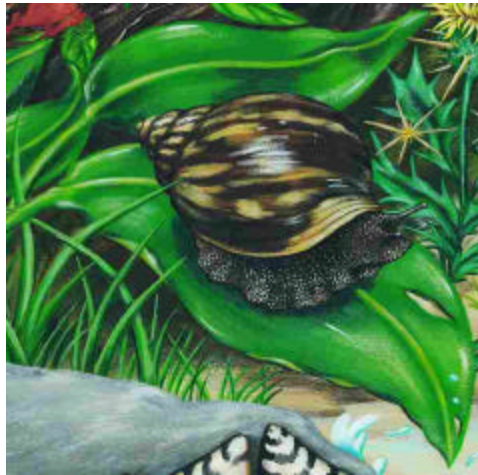
### **4. FOODBORNE ILLNESS PRIMER ANNOUNCED AT NATIONAL PRESS CLUB**

Release of the 2<sup>nd</sup> edition of Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Health Care Professionals, was announced at an April 7 meeting of the National Press Club. This document was created through a partnership initiative of the American Medical Association (AMA), American Nurses Association (ANA), US Centers for Disease Control and Prevention (CDC), the US Food and Drug Administration (FDA), and the US Department of Agriculture (USDA). The primer is free to all health care professionals and contains charts, scenarios, and a continuing medical education section. The 2<sup>nd</sup> Edition builds

on information from the 1<sup>st</sup> Edition released in 2001, and includes five new sections on emerging foodborne illnesses, written with an emphasis on living in the post 9-11 environment.

The primer is available online in pdf format, at <http://www.ama-assn.org/go/foodborne>

## 5. THE TALE OF THE GIANT AFRICAN SNAIL(*ACHATINA FULICA*)



Recently a situation arose in Wisconsin regarding the Giant African Snail. The Bureau of Communicable Diseases received a call from the Health Officer, City of Menasha Health Department who received a telephone call from the principal of a local elementary school regarding public health risks associated with Giant African Snails. A parent of an elementary school student brought several of these snails into the child's classroom for the children to observe. A student in the classroom was allowed to hold one of the snails with the parent's consent. The student washed his hands after handling the snail. Another student in the classroom also wanted to hold one of the snails. The principal wouldn't allow him to do so without parental permission. The second child's mother, not being familiar with these snails, checked the Internet and found the snails were illegal to possess in the U.S. under the Plant Pest Act of 2000. Following the phone call from the school principal, the health officer requested the snails be removed from the classroom and be kept someplace secure until more information on health risks associated with the snails could be obtained. The snails were then moved to the principal's office.

The health officer visited the school, saw the snails and interviewed the mother who brought the snails to school. She received the snails from a relative in Wisconsin as part of a white elephant gift exchange during a family celebration. The parent did not know the snails could be harmful to humans and could cause significant environmental harm if released.

After notification by the Bureau of Communicable Diseases staff, an Agricultural Officer from the U. S. Department of Agriculture went to the school and collected the snails. The USDA agent suggested to the principal that information on these snails be put into a school district wide newsletter to alert others about these snails.

**Comment.** The Giant African Snail is very large, reaching up to 8 inches in length. These snails can act as a vector for the rat lungworm (*Angiostrongylus cantonensis*). This parasite can cause eosinophilic meningitis in humans. Humans may be infected by ingestion of the mucous secretions of the snails. These snails also have a voracious appetite and feed on a wide range of plants including fruits and most vegetables and can be a major agricultural pest. Although found in more tropical environments, the African Giant Snail can survive in snow and cold conditions by hibernating until warm weather returns. They are also very proficient at reproduction. The snails are hermaphroditic (possessing both male and female reproductive organs) and can produce 100 to 400 eggs per clutch and can lay multiple clutches per season.

This is the second time in four months that this issue has surfaced and those snails have been found and confiscated in Wisconsin. In November of 2003, Federal regulatory officials seized 150 illegal Giant African Snails and their eggs from pet shops, schools, and animal swap meets in central, southern, and eastern WI. The presence of these snails has triggered concern that the snails might be distributed from Wisconsin to warmer, southern states where they would easily survive and cause major damage to vegetation. As a result, the Animal and Plant Health Inspection Service (APHIS), of the U.S. Department of Agriculture has decided to increase the surveillance of these snails in Wisconsin.

If you know of anyone that has these snails, please contact the Madison office of the Animal and Plant Health Inspection Service (608-231-9545) and they will collect the snails. If you have concerns about these snails or other exotic animals in schools in your jurisdiction, please contact John Archer (608-267-9009) or Jim Kazmierczak (608-266-2154) in CDES.

*This report was prepared by:  
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### **Telephone Reporting of Unusual Disease Occurrences**

*Occurrences of diseases that are uncommon or atypical in Wisconsin, and outbreaks or clusters of disease which are identified, should be reported by phone as soon as possible, to (608) 258-0099. Reports may be made to this number on a 24/7 basis, but please do not use it for normal and routine disease reporting*

#### **To be added to or removed from the distribution list contact:**

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